

CLAIMS

1. A method of determining the condition of an electroplated grinding wheel in a grinding machine having a grinding force sensor, while grinding a series of workpieces, the method comprising the steps of:
 - grinding successive workpieces with the grinding wheel and
 - 5 recording a series of readings of grinding force over selected portions of the grinding of the successive workpieces and relaying the grinding force information to a controller;
 - determining the averages of grinding forces recorded in said selected portions of the grinding of the successive workpieces;
 - 10 comparing the averages of the recorded grinding forces of the successive workpieces to quantify an increase in average grinding force between selected portions of the grinding of the successively workpieces; and
 - actuating a fault signal when the increase in average grinding force exceeds a predetermined force increase limit indicating that the
 - 15 grinding wheel is near the end of its life cycle.
2. The method as in claim 1 including comparing a predetermined grinding force limit with the average of recorded grinding forces of each selected portion of the grinding of the successive workpieces to determine if any of the compared averages exceeds the predetermined
 - 5 grinding force limit.
3. The method as in claim 2 including actuating the fault signal when any of the compared averages exceeds the predetermined grinding force limit indicating that the grinding wheel is near the end of its life cycle.

4. The method as in claim 1 wherein the selected portion of the grinding is during the last rotation of the workpiece.
5. The method as in claim 1 wherein the selected portion of the grinding is during the second to the last rotation of each workpiece.
6. The method as in claim 2 wherein the grinding force limit is established by adding at least 10 percent of the force capability of the grinding machine to the average grinding force of a typical workpiece with an unused grinding wheel.
7. The method as in claim 1 wherein the predetermined force increase limit is 40 percent greater than the average grinding force of an immediately preceding ground workpiece.
8. The method as in claim 1 including recording a series of readings of grinding motor torque over selected portions of the grinding of successive workpieces and relaying the grinding motor torque information to a controller.
9. The method as in claim 8 including determining the averages of grinding motor torque recorded in said selected portions of the grinding of the successive workpieces.
10. The method as in claim 9 including comparing the averages of the recorded grinding motor torque during the selected portion of the grinding of each of the successive workpieces to quantify an increase in average grinding motor torque between selected portions of the grinding of the successive workpieces.

11. The method as in claim 10 including actuating the fault signal when the increase in average grinding motor torque exceeds a predetermined motor torque limit indicating that the grinding wheel is near the end of its life cycle.

12. The method as in claim 9 including comparing a predetermined motor torque limit with the average motor torque of each selected portion of the grinding of the successive workpieces to determine if any of the compared averages exceeds the predetermined motor torque limit.

13. The method as in claim 12 including actuating the fault signal when any of the compared averages of motor torque exceeds the predetermined motor torque limit indicating that the grinding wheel is near the end of its life cycle.

14. The method as in claim 13 wherein the motor torque limit is established by adding at least 10 percent of the motor torque capability of the grinding machine to the average motor torque of a typical workpiece with an unused grinding wheel.

15. The method as in claim 11 wherein motor torque increase limit is 40 percent greater than the average motor torque of an immediately preceding ground workpiece.

16. The method as in claim 1 wherein actuating the fault signal stops the grinding machine.